A taxonomic revision of *Drypetes* Vahl (Euphorbiaceae) in Australia

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Summary

Forster, Paul I. (1997). A taxonomic revision of *Drypetes* Vahl (Euphorbiaceae) in Australia. *Austrobaileya* 4(4): 477–494. The genus *Drypetes* is revised for Australia. Four species are recognised, *Drypetes acuminata* P.I.Forst., sp. nov., *D. deplanchei* (Brongn. & Gris) Merr., *D. iodoformis* L.S.Sm. ex P.I.Forst., sp. nov. and *D. vernicosa* P.I.Forst., sp. nov. All species are described and illustrated and notes are provided on their distribution, habitat and conservation status. The name *Cyclostemon subcubicus* J.J.Sm. is lectotypified. The name *Drypetes subcubica* (J.J.Sm.) Pax & K.Hoffm. has been misapplied to the Australian taxon here named *D. iodoformis*.

Key words: Euphorbiaceae; *Drypetes* - Australia, *Cyclostemon subcubicus*, *Drypetes acuminata*, *Drypetes deplanchei*, *Drypetes iodoformis*, *Drypetes subcubica*, *Drypetes vernicosa*.

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Introduction

The genus *Drypetes* was named by Vahl (1807) based on material from the New World. *Drypetes* comprises approximately 200 species (Webster 1994) and is widely distributed in the tropics and subtropics with the greatest concentration of species in the neotropics. The majority of species are trees or shrubs which occur in rainforest or communities with a significant level of rainforest elements.

The genus was included by Webster (1994) in Euphorbiaceae, subfamily Phyllanthoideae, tribe Drypeteae (Griseb.)Hurusawa together with the genera *Lingelsheimia* Pax, *Sibangea* Oliver and *Putranjiva* Wallich. *Drypetes* is distinctive in this tribe by its combination of 1 or 2-locular ovary, drupaceous fruit, presence of a disk in the flowers, and the pistillate sepals imbricate in bud and deciduous in the fruit (Webster 1994). No modern monograph of *Drypetes* is available and recent work has concentrated on regional flora accounts (e.g. Radcliffe-Smith 1987; McPherson 1991).

In Australia, one or two species of *Drypetes* have been recognised in flora accounts (Mueller 1866; Bentham 1873; Bailey 1902). The most recent accounts of the genus in Australia by Airy Shaw (1980b) and Hyland & Whiffin (1993) recognise two species, *D. lasiogyna* (F.Muell.) Pax & K.Hoffm. (syn. *D. australasica* (Müll.Arg.) Pax & K.Hoffm.) and *D. subcubica* (J.J.Sm.) Pax & K.Hoffm.

The former species is a widely distributed and well known plant of the 'dry' rainforests and thickets and has undergone continual name changes in recent times (Airy Shaw 1980b; Green 1986, 1990, 1994). Green (1990) first pointed out that *D. lasiogyna* was conspecific with *D. deplanchei* (Brongn. & Gris) Merr., the latter name being based on a type from New Caledonia.

The taxon known as *D. subcubica* is a rarely encountered rainforest plant from the 'Wet Tropics' of north-east Queensland. The Australian plants known as *D. subcubica* are not conspecific with the type of that name and belong to a new species described in this paper. In addition, two new endemic species, both from rainforest communities, are recognisable and are also described herein. Hence the genus *Drypetes* now comprises four species in Australia.

Two groups may be recognised for the Australian species of *Drypetes*. One group may be distinguished by the presence of entire stigmas and the disk in the male flowers being

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cupuliform or reduced to small lobes. This group comprises *D. deplanchei* and the new species *D. acuminata* and *D. vernicosa*. The second group may be distinguished by the presence of bifid stigmas and the disk in the male flowers being comprised of numerous irregular, oblong to subulate processes. This second group comprises only *D. iodoformis*. Whether these two groups form natural units within the genus can only be determined by monographic study.

Materials and methods

This work is based on herbarium collections in AD, BO, BRI, CANB, CBG, DNA, MEL, NSW, PERTH and QRS, photographs of types at K and P, and field collections and observations by the author.

Floral descriptions were prepared from material preserved in spirit (FAA or 70% alcohol and 5% glycerol) or reconstituted by boiling in water and detergent. Fruit descriptions were prepared from material preserved in spirit or dried. Foliage and inflorescence descriptions were prepared from dried material. Indumentum cover is described using the terminology of Hewson (1988), except that 'scattered' is used instead of 'isolated'. Indumentum in Australian *Drypetes* species comprises uniseriate, multicellular hairs. Descriptions of seedlings are based on specimens preserved at QRS.

The 'Wet Tropics' is defined as that area of north-eastern Queensland that encompasses the 'hot, humid, vine forests' from near Cooktown in the north to Paluma in the south (Webb & Tracey 1981; Barlow & Hyland 1988). Rainforest typology follows Webb (1978).

Taxonomy

Drypetes Vahl, Eclog. Amer. 3: 49 (1807). **Type:** *D. glauca* Vahl.

Derivation of name: from the Greek *drupetes*, meaning fully ripe.

Cyclostemon Blume, Bidjr. 597 (1826). **Type:** *Cyclostemon macrophyllum* Blume (= *Drypetes macrophylla* (Blume) Pax & K.Hoffm.), *fide* Webster (1994: 47).

Hemecyclia Wight & Arn., Edinburgh New Philos. J. 14: 297 (1833). **Type:** *Hemicyclia sepiaria* Wight & Arn. (= *Drypetes sepiaria* (Wight & Arn.) Pax & K.Hoffm.

Further generic synonyms are listed by Webster (1994), but have not been used for Australian taxa.

Shrubs or trees, deciduous or evergreen, perennial, dioecious or rarely monoecious; stems and foliage without conspicuous latex. Indumentum of simple, multicellular trichomes; glandular trichomes absent; stinging trichomes absent. Stipules entire, inconspicuous, deciduous. Leaves alternate, petiolate to sessile, elobate, penninerved, entire to crenate or serrate, with glands absent. Inflorescences terminal or axillary, racemose or spicate, solitary, generally unisexual, with flowers in bracteate clusters. Male flowers pedicellate; sepals 4 or 5, imbricate, cucullate; petals absent; stamens 3–50, filaments free and attached to slightly convex receptacle; anthers dorsifixed, bilobate, introrse, with thecae oblong and longitudinally dehiscent; disk cupuliform, ± entire, lobed or lacinate, sometimes much reduced; pistillodes absent or minute. Female flowers pedicellate; sepals 4 or 5, imbricate, cucullate; petals absent; disk hypogynous, annular, cupular, of several lobes or rarely ± absent; ovary 1–2-locular; ovules biloculate; styles short; stigmas flattened, bifid or entire. Fruit drupaceous, uni-, bi- or trilobate, globose, ovoid or ellipsoid; pericarp fleshy; endocarp coriaceous or papery. Seeds solitary by abortion, ecarunculate; testa crustaceous; albumen fleshy; cotyledons broad, flat.

A pantropical genus of c. 200 species. Four species in Australia.

Key to the Australian species of *Drypetes*

1. Stipules and floral bracts linear-lanceolate; male flower sepals 1.5–2.5 mm long . . . . **3. D. vernicosa**
   Stipules and floral bracts lanceolate-triangular; male flower sepals 2.5–4 mm long 2

2. Cut stem with iodoform scent; stipules c. 1 mm long and 0.5 mm wide; stigmas bifid; male flower pedicels 1.5–2 mm long; stamen filaments 1–2 mm long . . . . **4. D. iodoformis**
   Cut stem without iodoform scent; stipules 0.4–0.6 mm long, 0.2–0.3 mm wide; stigmas entire; male flower pedicels 3.2–8 mm long; stamen filaments 0.3–0.7 mm long 3

3. Leaf lamina oblanceolate, with tip acuminate; male flower pedicels 3.2–4.5 mm long; disk in male flower much reduced to small lobes . . . . **2. D. acuminata**
   Leaf lamina elliptic, elliptic-lanceolate, ovate-elliptic, oblong or orbicular, with tip acute, rounded or obtuse; male flower pedicels 5–8 mm long; disk in male flower cupuliform or of irregular lobes . . . . **1. D. deplanchei**

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1. Drypetes deplanchei (Brongn. & Gris) Merr., J. Arnold Arbor. 32: 199 (1951); *Elaeocarpus deplanchei* Brongn. & Gris, Bull. Soc. Bot. France 10: 477 (1863); *Hemicyclia deplanchei* (Brongn. & Gris) Baill. ex Guillaumin, Ann. Mus. Colon. Marseille, Ser. 2, 9: 224 (1911). **Type:** New Caledonia, *Deplanche* 463 (holo: P n.v., photo at BRI; fide McPherson (1991: 12)).

Hemicyclia lasiogyna F.Muell., Fragm. 4: 119 (1864); *Drypetes lasiogyna* (F.Muell.) Pax & K.Hoffm. in Engl. Pflanzenr. 25: 272 (1922). **Type:** Northern Territory. Port Essington, *Leichhardt* (holo: ?MEL n.v.).

Hemicyclia sepiaria var. *oblongifolia* Benth., Fl. Austral. 6: 117 (1873). **Type:** Northern Territory. Port Darwin, on the beach, *Schultz* 746 (holo: K *n.v.*, photo at BRI).

Hemicyclia australasica Müll.Arg. in DC., Prodr. 15(2): 487 (1866); *Hemicyclia sepiaria* var. *australasica* (Müll.Arg.) Baill., Adansonia 6: 330 (1866), in obs.; *Drypetes australasica* (Müll.Arg.) Pax & K.Hoffm. in Engl., Pflanzenr. 15: 270 (1922); *Drypetes lasiogyna* var. *australasica* (Müll.Arg.) Airy Shaw, Kew Bull. 35: 628 (1980). **Type:** Queensland. NORTH KENNEDY DISTRICT: Burdekin River, *F.Mueller* (holo: G–DC n.v., fiche at BRI; iso: K n.v., photo at BRI).

Drypetes affinis Pax & K.Hoffm. in Engler, Pflanzenr. IV. 147XV (Heft 81): 271 (1922); *D. lasiogyna* subsp. *affinis* (Pax & K.Hoffm.) P.S.Green, J. Arnold Arbor. 67: 111 (1986); *D. deplanchei* subsp. *affinis* (Pax & K.Hoffm.) P.S.Green, Kew Bull. 45: 239 (1990). **Type:** Lord Howe Island, 'F.Mueller' [C. Moore] (holo: B n.v., destroyed).

Illustrations: Francis (1981: 220, 221); Williams (1987: 111); Brock (1988: 144); Floyd (1989: 145); Hauser (1992: 152).

Shrub or small tree to 12 m high, perennial, dioecious, fleetingly deciduous. Bark patchy grey and white, ± flaky; blaze distinctly layered and pale amber and yellowish; trunk sometimes weakly fluted. Leaf-bearing stems up to 2 mm diameter, ± rounded, lenticellate, glabrous or with sparse hairs. Stipules lanceolate-triangular, 0.4–0.5 mm long, 0.2–0.3 mm wide, glabrous or with scattered to sparse hairs. Leaves petiolate, discolorous, glabrous; petioles 2–7 (15) mm long, 0.4–1.5 mm wide, flattened and usually channelled on top, with scattered hairs; juvenile lamina toothed with up to 12 teeth per side of midrib on margin, each tooth up to 8 mm long; mature lamina coriaceous, elliptic, elliptic-lanceolate, ovate-elliptic, ±orbicular or oblong, 8–150 mm long, 6–60 mm wide; margins entire or slightly sinuate, slightly revolute; tip acute, rounded or obtuse; base cuneate, rounded or truncate; midrib prominently raised below, yellowish; venation comprising 9–12 lateral veins per side of midrib and reticulate interlateral tertiary veins; upper surface dark matt green, with venation distinct but not prominent; lower surface pale matt green, with venation prominent. Male inflorescences rarely branched and up to 15 mm long, comprising fascicles of 3-many flowers; peduncle 3–4 mm long; bracts lanceolate-triangular, 0.5–1 mm long, 0.2–0.4 mm wide, with scattered hairs. Male flowers 2–3 mm long, 4–6 mm diameter; pedicels 5–8 mm long, 0.4–0.5 mm diameter, glabrous or with scattered hairs; sepals 4, imbricate, orbicular-ovate, 2.5–4 mm long, 1.5–3.5 mm wide, glabrous or with scattered hairs externally; stamens 6–10, with filaments 0.3–0.7 mm long, c. 0.1 mm diameter, glabrous; anthers oblong in outline, 0.7–1.5 mm long, 0.5–1 mm wide, glabrous or with an occasional hair; disk cupuliform or irregularly lobed, 0.5–0.8 mm long, glabrous or with occasional hair. Female inflorescence up to 10 mm long, comprising solitary flowers or with axis branching several times; peduncle up to 5 mm long; bracts lanceolate-triangular, 0.3–0.7 mm long, 0.2–0.4 mm wide, with scattered hairs. Female flowers 2–3.5 mm long, 4–6 mm diameter; pedicels 3–10 mm long, 0.5–0.6 mm diameter, with scattered to sparse hairs; sepals 4, imbricate, orbicular-ovate, cucullate, 2.2–3.5 mm long, 1.5–2.5 mm wide, with scattered hairs externally; disk cupuliform, 0.4–0.8 mm long, glabrous or with scattered hairs; ovary 1.5–2.5 mm long, 1.5–2 mm diameter, glabrous or with dense hairs; styles much reduced with stigmas flabellate, adpressed to top of ovary, 1–1.5 mm long, entire. Fruit ellipsoid 10–25 mm long, 7–15 mm diameter, orange to red, glabrous. Seedlings (cotyledon stage): cotyledon petioles up to 1.5 mm long and 0.5 mm wide; lamina ovate, 20–24 mm long, 17–19 mm wide with tip rounded and base truncate to ± cordate, 3-nerved from base. Seedlings (three-leaf stage): leaves petiolate; petioles 1.5–2 mm long, c. 1 mm wide; lamina ovate, strongly dentate, 22–34 mm long, 15–25 mm wide, with 6 or 7 lateral veins; tip acute; base cuneate. *Yellow Tulip.* **Fig. 1.**

***Selected additional specimens examined*: Western Australia.** Anjo Peninsula, Sharp Point, 13°56'S, 126°32'E, May 1984, *Forbes* 2263 (MEL, PERTH); SE coast of Osborne Island, Admiralty Gulf, 14°23'S, 125°57'E, Apr 1991, *Willing* 320 (PERTH); Naturalist Island in Prince Frederick Harbour, W of entrance to Hunter River, W. Kimberley coast, 15°02'S, 125°21'E, May 1987, *Kenneally* 9911 (PERTH, QRS). **Northern Territory.** Casuarina Beach, near Darwin, 12°21'S, 130°53'E, Nov 1989, *Forster* 5932 (BRI, DNA); Channel Point, 13°09'S, 130°07'E, Nov 1990, *Russell-Smith* 8361 & *Petherick* (BRI, CANB, DNA, MEL); Mt Ranken, Walker River, 13°35'S, 135°35'E, Nov 1987, *Russell-Smith* 4293 & *Lucas* (BRI, DNA); 2 km N of mouth of Emerald River, Groote Eylandt, 14°03'S, 136°25'E, Mar 1988, *Russell-Smith* 5095 & *Lucas* (BRI, DNA); 55 km N of Ngukurr, 14°14'S, 134°43'E, Nov 1987, *Russell-Smith* 4209 & *Lucas* (BRI, DNA). **Queensland.** COOK DISTRICT: Weipa area, 12°40'S, 141°50'E, Jan 1990, *O'Reilly* 572 (BRI, QRS). NORTH KENNEDY DISTRICT: Daydream Island, near Molle Island, 20°15'S, 148°51'E, Apr 1990, *Batianoff* 12272 (BRI). SOUTH KENNEDY DISTRICT: Shaw Island, 20°29'S, 149°09'E, Nov 1985, *Batianoff* 3204 (BRI). LEICHHARDT DISTRICT: Lake Elphinstone, 21°33'S, 148°13'E, Nov 1987, *Champion* 314 (BRI). PORT CURTIS DISTRICT: Moores Creek, 23°20'S, 150°35'E, Oct 1976, *Hyland* RFK4336 (BRI, QRS). BURNETT DISTRICT: Coalstoun Lakes N.P., 25°35'S, 151°54'E, Mar 1991, *Forster* 7831 (BRI, K, L, MEL, QRS). WIDE BAY DISTRICT: Stony Creek, 4 km E of Didcot, 25°29'S, 151°54'E, Oct 1990, *Forster* 7523 (BRI, K, L, MEL, QRS); Fairlies Knob, 10 km NNE of Brooweena, 25°30'S, 152°12'E, Dec 1990, *Forster* 7679 (BRI, K, L, MEL, MO, PERTH, QRS, SAR); Mt Glastonbury, S.F. 242 Glastonbury, 26°14'S, 152°27'E, Dec 1991, *Forster* 9283 & *Sharpe* (BRI, K, L, MEL, QRS). MORETON DISTRICT: World's End Pocket, N of Ipswich, 27°31'S, 152°5'E, Sep 1985, *Bird* [AQ398854] (BRI, CANB, MEL); Mt Blaine, 25 km S of Ipswich, 27°47'S, 152°48'E, Apr 1993, *Bird* [AQ566755] (BRI). **New South Wales.** Wilson Park, Lismore, 28°49'S, 153°16'E, Jul 1981, *Harden & Williams* 81292 (BRI, NSW).

***Distribution and habitat*:** *Drypetes deplanchei* is widespread in northern Western Australia, the Northern Territory and eastern Queensland, with a few records from north-east New South Wales (**Map 1**). The species also occurs in New Caledonia, southern New Guinea and Lord Howe Island. Plants are usually encountered in microphyll and notophyll vine thickets and vine forests of various types (especially hoop-pine rainforest, softwood scrub, beach scrubs), but may also occur in sheltered gullies in open forest or woodland.

The species is bird dispersed (Floyd 1989; Innis 1989; Russell-Smith & Lee 1992) with

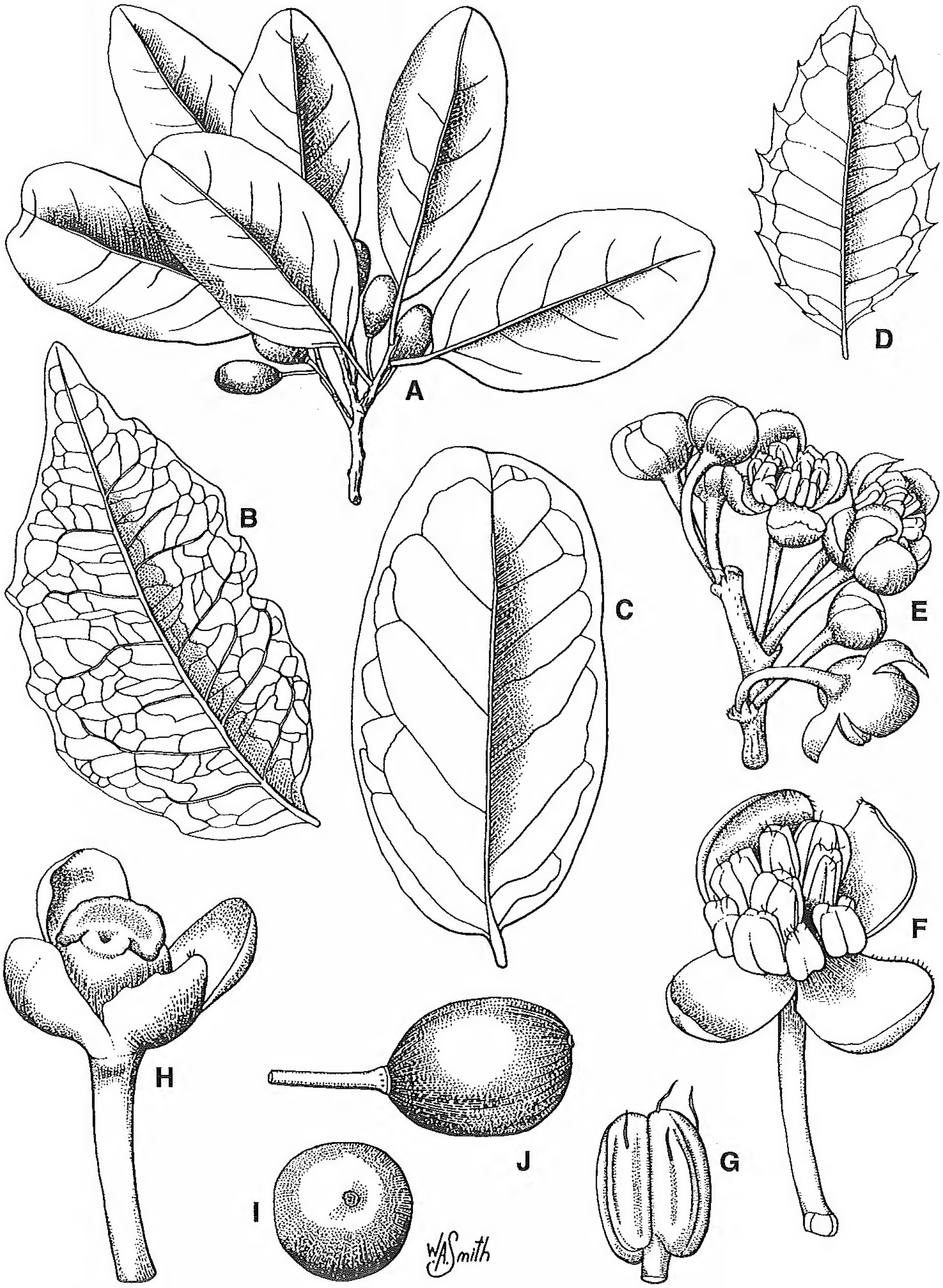
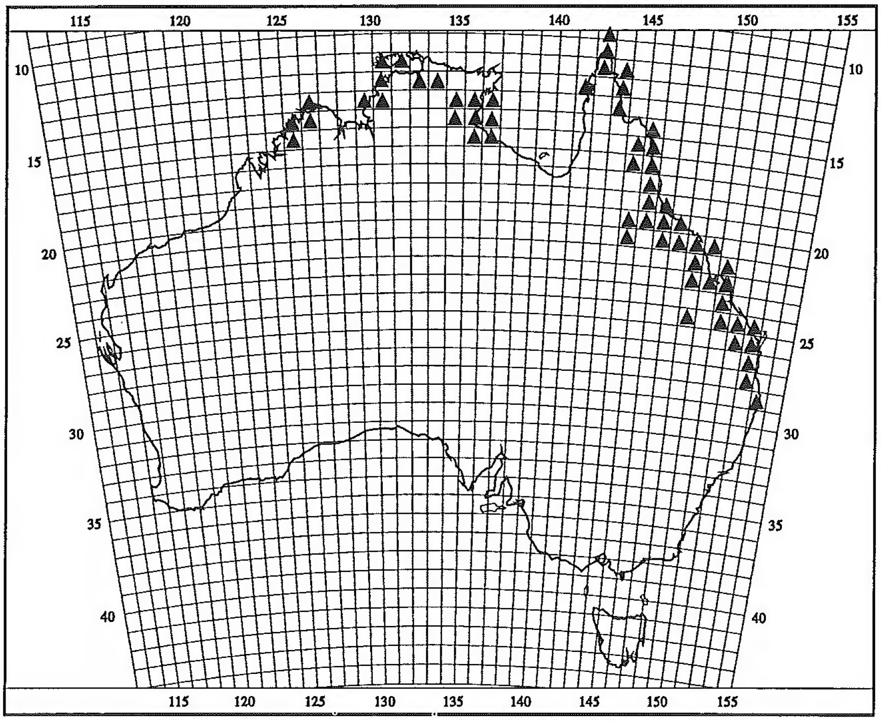


Fig. 1. *Drypetes deplanchei*. A. fruiting twig × 0.5. B & C. adult leaves × 0.75. D. juvenile leaf × 0.75. E. male inflorescence × 3.5. F. male flower × 7. G. stamen × 14. H. female flower × 7. I. lateral view of fruit × 1.7. J. apical view of fruit × 1.7. A,C from *Russell-Smith* 5109 & *Lucas* (BRI); B from *Forster* 3247 (BRI); D from *Harden* & *Williams* 81292 (BRI); E–G from *Forster* 12140 (BRI); H from *Forster* 7679 (BRI); I–J from *Forster* 7831(BRI). Del. W. Smith.



Map 1. Distribution of *Drypetes* in Australia. ▲ *D. deplanchei*.

Torres Strait Pigeons known to feed on it at Weipa (label data of *O'Reilly* 572) and Emerald Doves, Topknot Pigeons and Wompoo Fruit-Doves in New South Wales (Floyd 1989). This apparent vagility is reflected by its ubiquity throughout its known range. A good example of this is its presence in 91.8% of 232 localities of vine forest in south- east Queensland (Forster et al. 1991).

Notes: This plant has a chequered and potentially confusing nomenclatural history, excerbated in recent times by renaming and transfers (Airy Shaw 1980b; Green 1986, 1990, 1994). Peter Green proposed an infraspecific classification for the species, with one subspecies (as *D. deplanchei* subsp. *affinis* in his 1994 account) restricted to Lord Howe Island and the other (as *D. deplanchei* subsp. *deplanchei*) in Australia, New Caledonia and New Guinea. These subspecies were distinguished only by fruit size, being 10–14 mm long in *D. deplanchei* subsp. *deplanchei* and 20–25 mm long in *D. deplanchei* subsp. *affinis*. Green's decisions were based on a restricted set of collections (mainly those at K) and his distinctions disappear when a much larger set of collections is examined. Although there appears to be continuous variation in fruit size, there are nevertheless some general trends based on a geographic basis that can be determined. Collections from Lord Howe Island, the Northern Territory and Western Australia tend to have large fruits (>15 mm long). Collections from north-east New South Wales and eastern Queensland tend to have small fruits (< 15 mm long). There are however, many and several notable exceptions to these trends, e.g. *Bird* [AQ566755] (BRI) from south-east Queensland has fruit over 20 mm long and wide. It is probable that fruit size in *D. deplanchei* is determined to some extent by environmental variables and, if used alone as a distinguishing character state, appears to be of dubious value in the recognition of infraspecific variants.

The presence of only pubescent ovaries in collections from the Northern Territory and Western Australia as opposed to only glabrous ovaries from eastern Australia and Lord Howe

Island appears to be consistent. However, there are few collections of female material from the Northern Territory and Western Australia, and more are required before taxonomic decisions can be made on this character state variation. As seedlings appear to be useful in providing diagnostic characters in *Drypetes*, future workers may wish to pursue this apparent discontinuity from biosystematic or other approaches. For the time being, therefore, a single variable taxon, *D. deplanchei*, is recognised throughout the species' range.

Uses: The timber of this species was used for printer's engraving blocks and for turning or carving (Francis 1981) and is suitable for joinery and flooring (Floyd 1989). Young stems were used for stockwhip handles (Floyd 1989).

Phenology: The main flowering period for this species is August to December, although there are occasional records for the rest of the year. Plants tend to be at least partially deciduous for a short period of time following spring/early summer storms and flower on older wood that is producing a flush of new foliage. Fruiting occurs throughout the year.

Conservation status: *Drypetes deplanchei* is widespread and common throughout its range. It is present in thirty-nine conservation reserves in south-east Queensland alone (Forster et al. 1991).

Ethnobotanical use: No uses have been recorded for *D. deplanchei* in the literature, although the species is known as 'Masal' on Dauan Island and 'Ak' on Yorke Island in Torres Strait (label data of *Lawrie* [AQ004004 & AQ003935]).

2. **Drypetes acuminata** P.I.Forst., **sp. nov.** affinis *D. deplanchei* (Brongn. & Gris) Merr. a qua lamina folii maturi oblanceolata apice acuminato, floribus masculinis pedicello breviore (3.2–4.5 mm vice 5–8 mm longo) et disco in lobos parvos multum reducto differt. **Typus**: Queensland. NORTH KENNEDY DISTRICT: Koolmoon Creek near Tully Falls [male plant], Oct 1953, *K.J.White* [AQ410313] (holo: BRI [2 sheets]; iso: K, MEL, QRS distribuendi).

[*Drypetes lasiogyna* var. *australasica* auct. non (Müll.Arg.) Airy Shaw; Airy Shaw (1981: 627 [pertaining to *Volck* 4386]); Hyland & Whiffin (1993 [pertaining to *Gray* 2939]).]

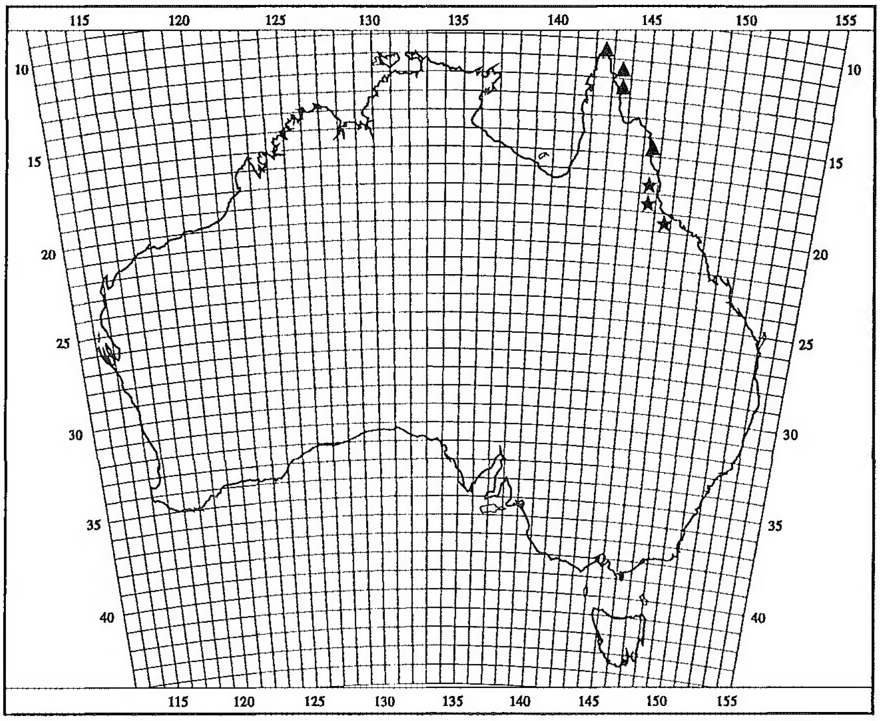
Illustration: Christophel & Hyland (1993: 103a [as *D. lasiogyna* var. *australasica*]).

Tree to 12 m high, dioecious, evergreen. Bark light brown, with irregular shallow, rounded flakes; blaze distinctly layered, cream and yellow-brown; trunk fluted. Leaf-bearing stems up to 3 mm diameter, ± rounded, with scattered hairs but soon glabrescent. Stipules lanceolate-triangular, 0.5–0.6 mm long, 0.2–0.3 mm wide, with sparse hairs. Leaves petiolate, discolorous, glabrous; petioles 5–8 mm long, c. 1 mm wide, channelled on top, glabrous or with scattered hairs; juvenile lamina entire; mature lamina coriaceous, oblanceolate, 37–120 mm long, 13–50 mm wide; margins slightly sinuate, weakly revolute; tip acute, short to long acuminate; base rounded or truncate, often unequal; midrib prominently raised below, yellowish; venation comprising 7–12 lateral veins per side of midrib and reticulate interlateral tertiary veins; upper surface dark matt green, venation indistinct; lower surface pale matt green, with venation distinct but not prominent. Male inflorescences up to 13 mm long, comprising fascicles of 5-many flowers, borne on older wood, with axis simple or rarely branched; peduncle up to 2 mm long; bracts lanceolate-triangular, 0.5–0.6 mm long, 0.2–0.4 mm wide, with sparse hairs. Male flowers 2.5–3 mm long, 3.5–4 mm diameter; pedicels 3.2–4.5 mm long, c. 0.2 mm diameter, with scattered hairs; sepals 4, imbricate, orbicular-ovate, 2.5–3 mm long, 2–2.5 mm wide, glabrous or with scattered hairs externally; stamens 6–9, with filaments 0.3–0.6 mm long, c. 0.1 mm diameter, glabrous; anthers oblong in outline, 1.2–1.5 mm long, 0.8–1.3 mm wide, glabrous; disk much reduced to small lobes, c. 0.5 mm long, glabrous. Female inflorescence of solitary flowers; peduncles obsolete; bracts not seen. Female flowers not seen; pedicels 9–18 mm long, 0.4–1 mm diameter, glabrous or with scattered hairs; ovary 2-locular, 3.5–4 mm long, c. 3 mm diameter, with dense antrorse yellow hairs; styles much reduced, with stigmas flabellate, adpressed to top of ovary, c. 1.5 mm long, entire. Fruit obloid-ovoid, 21–22 mm long, 9–11 mm diameter, red. Seedlings (cotyledon stage): cotyledons with petioles up to 2 mm long and 0.5 mm wide; lamina ovate, 37–30 mm long, 20–24 mm wide, with tip acute and base rounded, 3-nerved from base. Seedlings (three-leaf stage): leaves petiolate; petioles c. 4 mm long and 1 mm wide; lamina lanceolate-ovate, dentate, 54–70 mm long, 21–28 mm wide, with 8 or 9 lateral veins, with tip acuminate and base cuneate. **Fig. 2.**

Additional specimens examined: **Queensland.** Cook District: Leichhardt L.A., 12.5 km along Mt Lewis road, 16°35'S, 145°16'E, Jul 1994, *Forster* 15622 *et al.* (BRI); S.F.R. 194 (R263), 17°15'S, 145°25'E, Oct 1963, *Hyland* RFK484 (QRS); ditto, Nov 1963, *Hyland* RFK626 (QRS); ditto, Sep 1969, *Hyland* RFK2410 (QRS); S.F.R. 194 Western, Compartment 59, E.P. 36, 17°19'S, 145°26'E, Aug 1977, *Unwin* 477 (QRS); E.P. 43, S.F.R. 194, 17°19'S, 145°26'E, May 1979, *Sanderson* 1602 (QRS); R.194 Western, SW of Atherton, 17°20'S, 145°25'E, s.dat., *Volck* 4386 (BRI); S.F.R. 194, East Barron, E.P. 38, 17°25'S, 145°29'E, Dec 1977, *Unwin* 523 (QRS). North Kennedy District: S.F.R. 756, 17°40'S, 145°40'E, Nov 1963, *Hyland* RFK540 (QRS); S.F.R. 605, Dawson L.A., 17°59'S, 145°37'E, Jan 1983, *Gray* 2939 (QRS); Koolmoon Creek, c. 11 miles SSE of Ravenshoe, Sep 1950, *Smith* 4690A (BRI); Kirrama Range, between Society Flat & Yuccabine Creek, Aug 1947, *Smith* 3230 & *Webb* (BRI); N slope of Mt Thorn, S.F. 461, Meunga L.A., 23.1 km W of Cardwell, 18°16'S, 145°17'E, Oct 1988, *Jessup et al.* GJM2253 (BRI); Mt Spec forestry camp, Nov 1933, *Francis* [AQ387275] (BRI); Mt Spec, Paluma Range, Oct 1965, *Birch* [AQ202313] (BRI); Mt Spec, 18°55'S, 146°12'E, Jul 1968, *Hyland* RFK1573 (QRS); Cloudy Creek, Mt Spec N.P., 19°00'S, 146° 13'E, Mar 1988, *Fell* 677 (BRI); Benham's Lookout, Mt Spec N.P., Paluma Range, 19°00'S, 146°13'E, Dec 1993, *Forster* 14309 (BRI, QRS).

Distribution and habitat**:** *Drypetes acuminata* is restricted to the 'Wet Tropics' of north-east Queensland between Mt Lewis in the north to Paluma Range in the south (**Map 2**). Plants grow on ridges or along creek banks in simple notophyll evergreen vine forest on granite at altitudes between 600 and 1000 m.

Notes**:** *Drypetes acuminata* was first recognised as being specifically distinct by L.S. Smith who also made the first fertile collections of the species. Smith's material and the *K.J. White* collection remained unnamed at BRI. Airy Shaw determined several sterile specimens of this plant as *D. australasica* (now a synonym of



Map 2. Distribution of *Drypetes* in Australia. ▲ *D. vernicosa*, ★ *D. acuminata*.

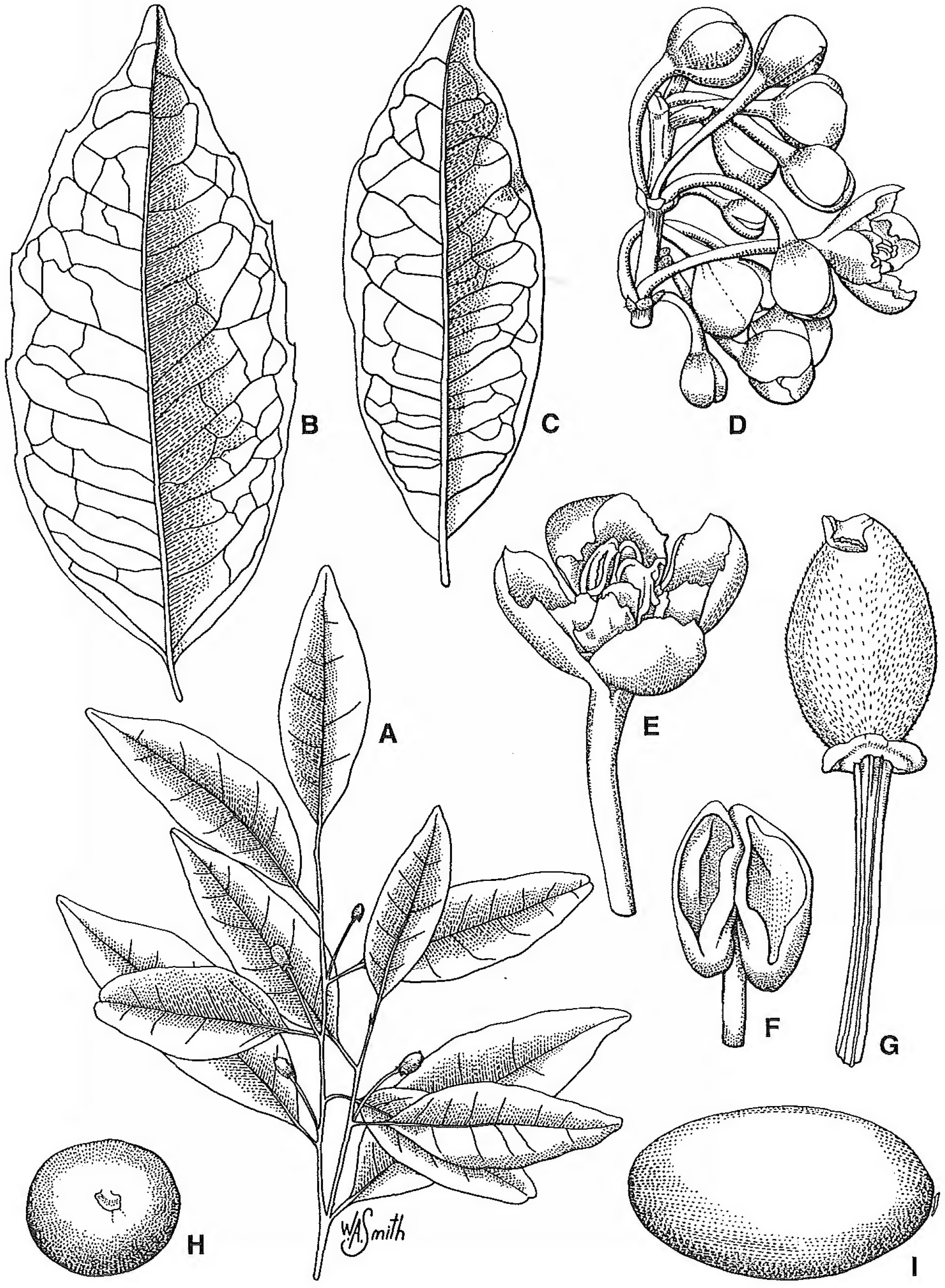


Fig. 2. *Drypetes acuminata*. A. fruiting twig × 0.5. B. juvenile leaf × 1. C. adult leaf × 1. D. male inflorescence × 4. E. male flower × 8. F. stamen × 16. G. female flower × 4. H. basal view of fruit × 2. I. lateral view of fruit × 2. A,C,G from *Francis* [AQ387275] (BRI); B from *Forster* 14309 (BRI); D–F from *White* [AQ410313] (BRI); I–H from *Winter* s.n. (BRI). Del. W. Smith.

Table 1. Comparison of diagnostic character states for *Drypetes acuminata*, *D. deplanchei* and *D. vernicosa*.

Character	*D. acuminata*	*D. deplanchei*	*D. vernicosa*
stipules	lanceolate-triangular 0.5–0.6×0.2–0.3 mm	lanceolate-triangular 0.4–0.5×0.2–0.3 mm	linear-lanceolate 0.5–0.9×0.2–0.3 mm
upper leaf surface	dark matt-green	dark matt-green	varnished glossy-green
leaf lamina shape	oblanceolate	elliptic, elliptic-lanceolate, elliptic-ovate, orbicular, or oblong	oblong, ovate-elliptic, or orbicular
leaf lamina tip	acuminate	acute, rounded or obtuse	acute or rounded
male floral bracts	lanceolate-triangular 0.5–0.6× 0.2–0.4 mm	lanceolate-triangular 0.5–1× 0.2–0.4 mm	linear-lanceolate 1.2–1.5× 0.2–0.3
male flower pedicel length (mm)	3.2–4.5	5–8	1.5–3.8
male flower sepals length× width (mm)	2.5–3× 2–2.5	2.5–4× 1.5–3.5	1.5–2.5× 1.4–2
male flower disk	reduced to small lobes	cupuliform or irregularly lobed	reduced to irregular lobes
juvenile leaves	dentate	strongly dentate	strongly dentate

D. deplanchei) and even mentioned the *Volck* collection as being the first record of this species from the Atherton Tableland. Hyland & Whiffin's (1993) account for *D. lasiogyna* var. *australasica* pertains to *D. acuminata*. A comparison of diagnostic character states for *D. acuminata*, *D. deplanchei* and *D. vernicosa* is made in **Table 1**. *D. acuminata* differs most noticeably from *D. deplanchei* in the leaf lamina being oblanceolate with an acuminate tip and the male flowers with longer pedicels and the disk much reduced.

Conservation status: *Drypetes acuminata* has rarely been collected, and its distribution and abundance in the field remains to be accurately determined. It is present in a number of State Forests and National Parks and is not thought to be rare or threatened.

Etymology: The specific epithet is derived from Latin *acuminatus* and refers to the distinctly acuminate leaf tips of this species.

3. **Drypetes vernicosa** P.I.Forst., **sp. nov.** affinis *D. deplanchei* (Brongn. & Gris) Merr. a qua foliis adaxialiter nitidi-vernicosis, stipulis et bracteis lineari-lanceolatis, floribus masculinis pedicello breviore (1.5–3.8 mm vice 5–8 mm longo), sepalis brevioribus (1.5–2.5 mm vice 2.5–4 mm longis) et disco multum reducto differt. **Typus:** Queensland. Cook District: 3.5 km NNE of Massy Creek Crossing, Silver Plains, 13°53'S, 143°31'E, [male plant], 15 Jul 1993, *P.I.Forster* 13615, *G.Sankowsky & M.C.Tucker* (holo: BRI [2 sheets + spirit]; iso: QRS).

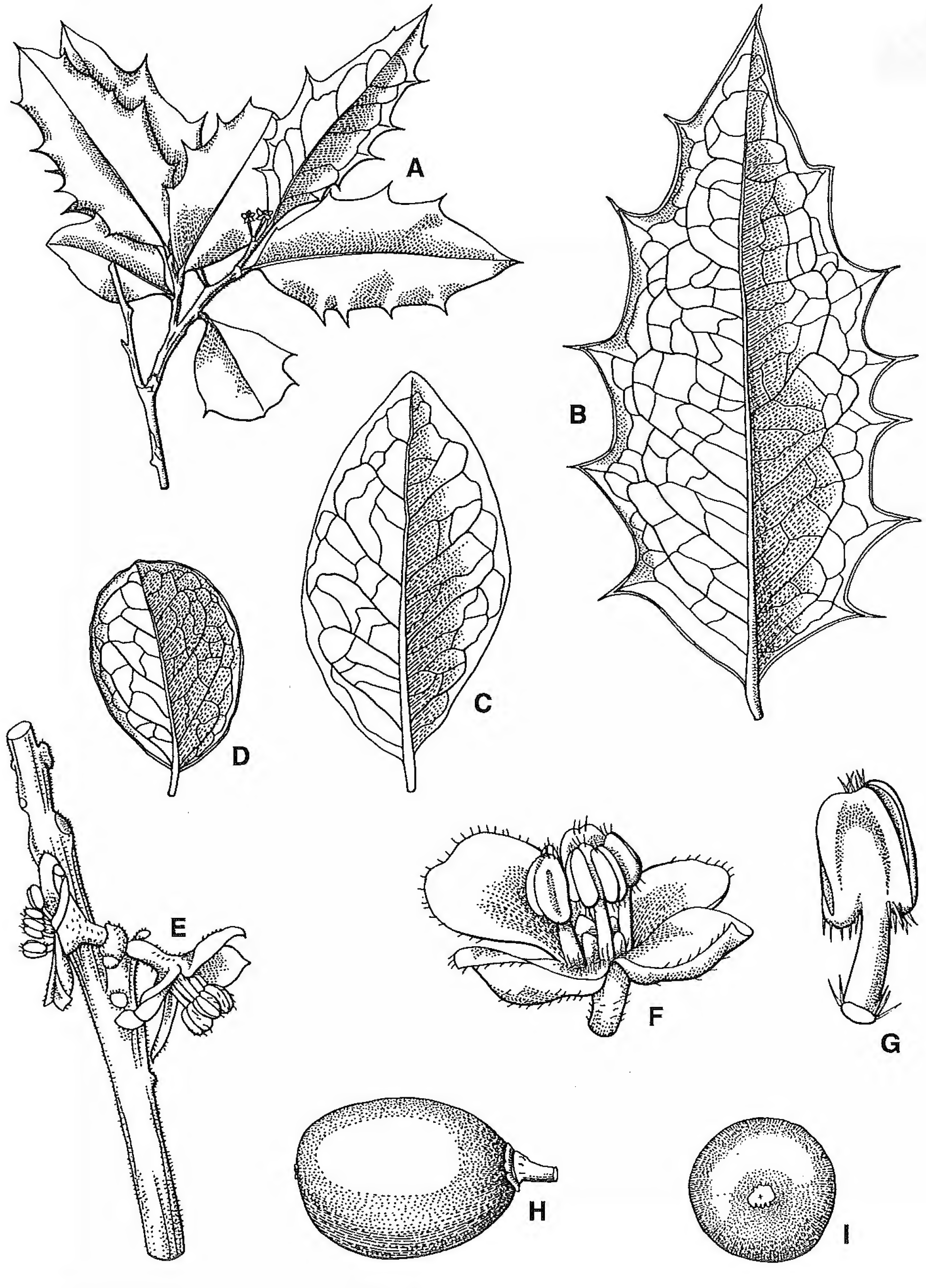


Fig. 3. *Drypetes vernicosa*. A. flowering male twig × 1. B-D. adult leaves × 1.5. E. male inflorescence × 5. F. male flower × 10. G. stamen × 20. H. lateral view of fruit × 2.5. I. apical view of fruit × 2.5. A–B, E–G from *Forster* PIF13615 (BRI); C from *Tracey* 14445 (BRI); D from *Forster* PIF8982 (BRI); H–I from *Webb & Tracey* 9718 (BRI). Del. W. Smith.

Subshrub or shrub to 4 m high, perennial, dioecious, evergreen. Bark white, nondescript; blaze distinctly layered and pale pink and yellowish; trunk often rather crooked. Leaf-bearing stems up to 3 mm diameter, ± rounded, with scattered to sparse hairs. Stipules linear-lanceolate, 0.5–0.9 mm long, 0.2–0.3 mm wide, with sparse hairs. Leaves petiolate, discolorous; petioles 1–5 mm long, 0.5–1 mm wide, channelled on top, with scattered hairs; juvenile lamina toothed; mature lamina coriaceous, oblong, ovate-elliptic or ±orbicular, 25–85 mm long, 8–40 mm wide; margins entire or strongly toothed with 4–9 teeth per side of midrib with each tooth 1–5 mm long and spine-tipped, weakly revolute; tip acute, rounded; base cuneate, rounded, ± equal; midrib prominently raised below, yellowish; venation comprising 7–10 lateral veins per side of midrib and reticulate interlateral tertiary veins; upper surface dark glossy green, with venation distinct but not prominent; lower surface pale matt green, with venation prominent. Male inflorescences much reduced, comprising fascicles of 1–3 flowers from old wood; peduncle up to 1 mm long; bracts linear-lanceolate, 1.2–1.5 mm long, 0.2–0.3 mm wide, with sparse hairs. Male flowers 2–3 mm long, 3–4 mm diameter; pedicels 1.5–3.8 mm long, 0.2–0.5 mm diameter, with scattered to sparse hairs; sepals 4 (or rarely 5), imbricate, orbicular, 1.5– 2.5 mm long, 1.4–2 mm wide, with scattered hairs externally; stamens 6, with filaments 0.5–0.7 mm long, c. 0.1 mm diameter, with scattered hairs; anthers oblong in outline, 0.5–1 mm long, 0.3–0.5 mm wide, glabrous; disk much reduced to irregular lobes to 0.4 mm long, with scattered to sparse hairs. Female inflorescence and flowers not seen. Fruit globose-ovoid, 10–15 mm long, 10–12 mm diameter, orange to red, glabrous. Seedlings (cotyledon stage): cotyledons ± sessile; lamina narrow-ovate, 17–19 mm long, 13–16 mm wide, with tip rounded and base ± truncate, 5-nerved from base. Seedlings (three-leaf stage): leaves petiolate; petioles 2–3 mm long, c. 0.5 mm wide; lamina narrow- ovate, strongly dentate, 17–33 mm long, 10–23 mm wide, with 5 or 6 lateral veins, with tip acute and base truncate. **Fig. 3.**

***Additional specimens examined*: Queensland.** Cook District: 1.5 km from Captain Billy Landing, 11°37'S, 142°50'E, Jun 1994, *Forster* 15368 (BRI, MEL, QRS); 2 km S of Captain Billy Landing, 11°39'S, 142°51'E, Oct 1993, *Fell* 3800 *et al.* (BRI); North of Olive River near mouth, 12°07'S, 143°05'E, Sep 1974, *Tracey* 14473* (BRI); N bank of Pascoe River c. 1 km inland from river mouth, 12°30'S, 143°15'E, Nov 1977, *Tracey* 14401* (BRI); 3 km NW of Bolt Head, Temple Bay, 12°14'S, 143°04'E, Jul 1991, *Forster* 8962* (BRI); 4.5 km WSW of the Nesbit River mouth, Silver Plains, 13°33'S, 143°32'E, Aug 1993, *Fell* 3445 et al. (BRI); Near lake to the east of Double Hill, 13°45'S, 143°30'E, Sep 1973, *Dockrill* 722 (BRI, QRS); Silver Plains, south of Scrubby Creek & west of Colmer Point, 13°46'S, 143°29'E, Jun 1995, *Forster* 17044 (BRI, DNA, MEL, NSW, QRS); 5 miles [8 km] N of crossing on Massy Creek on road between Silver Plains Station & Rocky River, 13°50'S, 143°29'E, Oct 1969, *Webb & Tracey* 9718 (BRI); 4 km NNE of Massy Creek Crossing, Silver Plains Station, 13°53'S, 143°30'E, Jun 1992, *Forster* 10572 et al. (BRI, QRS); 3 km NNE of Massy Creek Crossing, Silver Plains, 13°53'S, 143°31'E, Jul 1993, *Forster* 13607 et al. (BRI, QRS); Between Massy Creek & Rocky River, 13°55'S, 143°30'E, Sep 1971, *Hyland* 5492 (BRI, QRS); Starcke - Cape Flattery road, 15°04'S, 145°17'E, Jul 1976, *Tracey* 14445 (BRI); Abor. Res. 1, between McIvor River & Cape Flattery, 15°05'S, 145°15'E, Nov 1972, *Hyland* 6498 (BRI, QRS); road to Cape Flattery, c. 0.5 km W of beach, 15°07'S, 145°13'E, Jun 1992, *Le Cussan* 108 (QRS); 0.5 km W of the beach on the track from the McIvor River to Starcke Station, 15°07'S, 145°14'E, Aug 1984, *Clarkson* 5472 (BRI, MEL, NSW, QRS); 0.5 km from the beach on the track from Starcke Station to the mouth of the McIvor River, 15°07'S, 145°14'E, Feb 1984, *Clarkson* 5195 (BRI).

***Distribution and habitat*:** *Drypetes vernicosa* is endemic to eastern Cape York Peninsula from near Captain Billy Landing in the north to Cape Flattery in the south (**Map 2**). Plants grow in semi-evergreen microphyll vine thickets on fine white sand with a thin layer of organically stained topsoil at altitudes between 20 and 70 m.

***Notes*:** *Drypetes vernicosa* was first collected by Len Webb & Jeff Tracey in their pioneering study of the rainforests of eastern Australia; however, this and subsequent collections have usually been identified as *D. deplanchei* or one of its synonyms. The species is distinctive in its small shrubby stature, varnished upper leaf surfaces, linear-lanceolate stipules and bracts, and the male flowers with short pedicels and sepals (**Table 1**). Most collections are also distinctive in the well developed marginal teeth on adult leaf laminas, although those collections marked * have entire leaf laminas and some (e.g. *Forster* 8962) have leaf laminas that are ± orbicular in shape. Unlike *D. deplanchei*, the species most likely to be confused with *D. vernicosa*, flowers of this species are borne on old growth without shedding of the foliage.

Conservation status**:** *Drypetes vernicosa* is restricted in its occurrence and is sympatric with several other locally endemic species. At the Silver Plains locality these endemics include *Croton stockeri* (Airy Shaw) Airy Shaw and *Syzygium argyropedicum* B.Hyland. At Bolt Head and the Nesbit River mouth these include *Xanthostemon youngii* C.T.White & W.D.Francis and *S. argyropedicum*. At present *D. vernicosa*, although restricted in its occurrence, is not rare or endangered.

Etymology**:** The specific name is derived from Latin *vernicosus* (varnished) and alludes to the varnished appearance of the upper leaf lamina surface.

4. Drypetes iodoformis L.S.Sm. ex P.I.Forst., **sp. nov.** affinis *D. subcubicae* (J.J.Sm.) Pax & K.Hoffm. a qua floribus femineis singulis in quaque axilla, disco glabro, stylis bifidis lineari-flabellatis, ovario ovoideo, et fructu ellipsoidei-ovoideo differt. **Typus:** Queensland. Cook District: State Forest Reserve 607, West Logging Area, 17°00'S, 145°40'E, 11 Dec 1974, *B.Hyland* 7901 (holo: QRS; iso: BRI, CANB).

Drypetes sp. (=AFO/780; Hyland 1971: 64).

[*Drypetes subcubica* auct. non (J.J.Sm.) Pax & K.Hoffm.; Airy Shaw (1976: 365, 1980a: 78, 1980b: 628); Hyland & Whiffin (1993: 281)]

Illustration: Christophel & Hyland (1993: 103b [as *D. subcubica*]).

Tree to 20 m high, dioecious, evergreen. Bark grey, corky with whitish lenticels; blaze distinctly layered, greenish and yellowish, with a distinct 'iodiform' scent; trunks ±straight. Leaf-bearing stems up to 3 mm diameter, ± rounded, glabrous, sometimes with a zig-zag appearance. Stipules lanceolate-triangular, c. 1 mm long and 0.5 mm wide, glabrous. Leaves petiolate, discolorous, glabrous; petioles 3–6 mm long, 1–1.5 mm wide, channelled on top, sometimes twisted 1 or 2 times, with scattered hairs; juvenile lamina entire; mature lamina coriaceous, elliptic, lanceolate, ovate, 40–170 mm long, 15–70 mm wide; margins entire, slightly revolute; tip acute to short acuminate; base cuneate; midrib prominently raised above & below, yellowish; venation comprising 7–9 lateral veins per side of midrib and reticulate interlateral tertiary veins; upper surface dark glossy green, venation indistinct; lower surface pale matt green, venation prominent. Male inflorescences up to 1 mm long, comprising fascicles of 1–3 flowers; peduncles up to 1 mm long; bracts lanceolate-triangular, 0.9–1.2 mm long, 0.5–0.6 mm wide, glabrous. Male flowers 2–4 mm long, 4–8 mm diameter; pedicels 1.5–2 mm long, 0.5–0.7 mm diameter, glabrous; sepals 4, imbricate, orbicular-ovate, 2.5–3.2 mm long, 1.8–3.2 mm wide, with scattered hairs externally; stamens 6, with filaments 1–2 mm long, 0.1–0.2 mm diameter, glabrous; anthers oblong in outline, 1–1.7 mm long, 0.6–1.3 mm wide, glabrous; disk of numerous irregular oblong to subulate processes, 1–1.5 mm long, glabrous. Female inflorescence of solitary flowers; peduncle obsolete; bracts lanceolate-triangular, 1–2 mm long, 0.5–0.7 mm wide, with sparse hairs. Female flowers 3–4 mm long, 5–8 mm diameter; pedicels 3–4 mm long, 0.8–1 mm diameter, with sparse hairs; sepals 4, imbricate, orbicular-ovate, 3–4 mm long, 2.3–4 mm wide, with scattered hairs externally; disk cupuliform, 0.5–1 mm long, glabrous; ovary 2-celled, 2–2.5 mm long, 1.7–2.2 mm diameter, with dense silver hairs; styles much reduced; stigmas 2, linear-flabellate, adpressed to top of ovary, 0.8–1.5 mm long, bifid for ± entire length. Fruit ellipsoid-ovoid, 20–25 mm long, 12–15 mm diameter, orange to red, glabrous. Seedlings (cotyledon stage): cotyledons with petioles 1.5–3 mm long, 0.5–1 mm wide; lamina narrow-ovate, 42–52 mm long, 24–30 mm wide, with tip acute and base truncate to ± cordate, 3-nerved from base. Seedlings (three-leaf stage): leaves petiolate; petioles c. 3 mm long and 2 mm wide; lamina lanceolate-elliptic, crenate, 50–110 mm long, 17–32 mm wide, with 7–9 lateral veins; tip long acuminate; base attenuate. **Fig. 4.**

Selected additional specimens examined: **Queensland.** Cook District: T.R. 176 Monkhouse, Lorna Doona L.A., 15°48'S, 145°17'E, Feb 1983, *Hyland* 12601, 12604 (BRI, QRS); Mt Finnegan, 15°49'S, 145°18'E, Aug 1972, *Tracey* 14771 (BRI); Gold Hill, near China Camp between McDowall Range & Bloomfield, 16°03'S, 145°12'E, Jul 1973, *Tracey* 14801 (BRI); Mt Hemmant, just N of Noah Creek in Cape Tribulation area, 16°06'S, 145°26'E, Jul 1973, *Webb & Tracey* 11706 (BRI); V.C.L. Noah, 16°10'S, 145°25'E, Jun 1975, *Irvine* 1454 (BRI, CANB, QRS); Turpentine road, Little Cooper Creek, 16°10'S, 145°25'E, Nov 1989, *Jessup* et al. GJD2818 (BRI); Forest Reserve

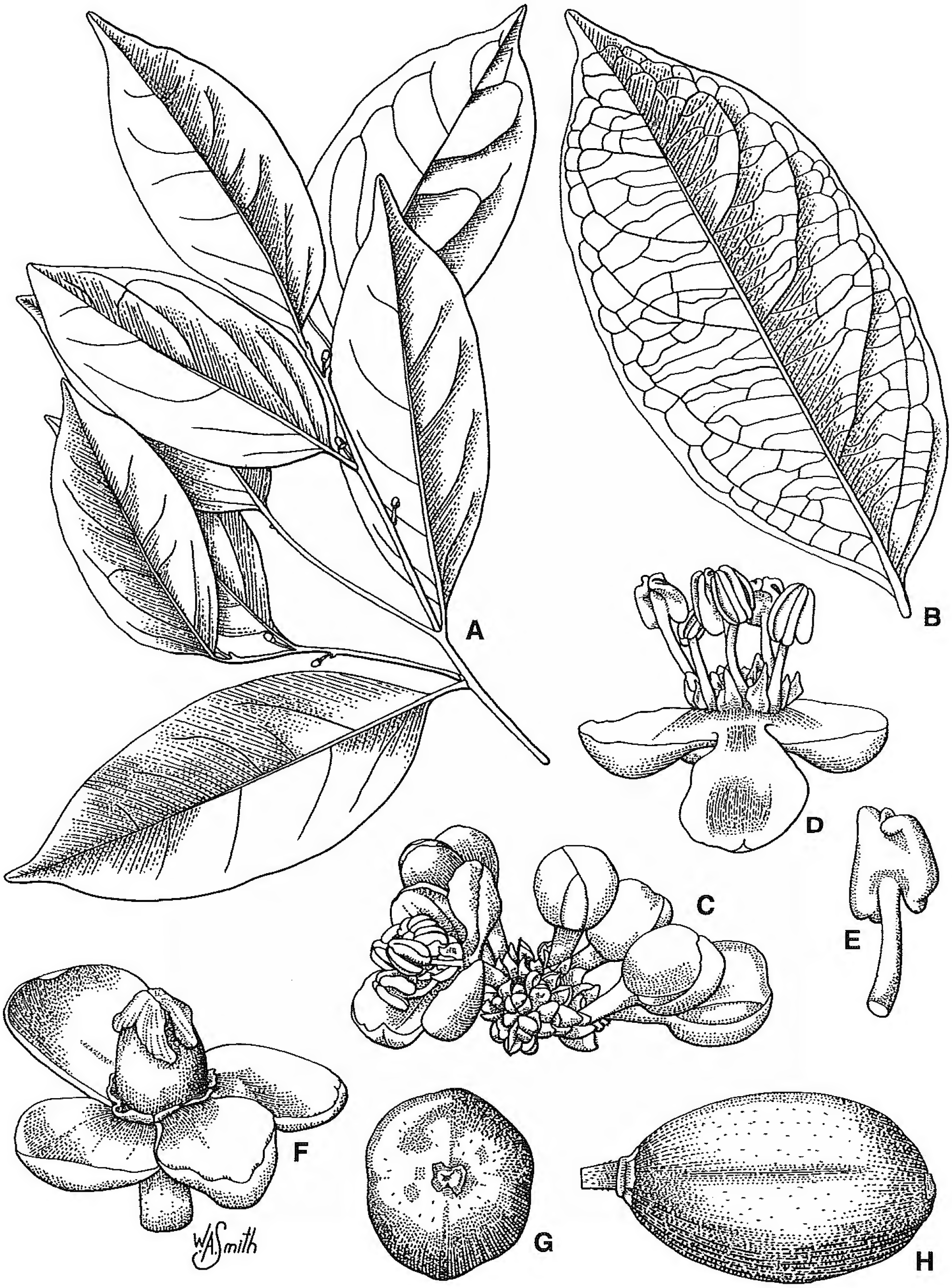


Fig. 4. *Drypetes iodoformis*. A. flowering male twig × 0.5. B. adult leaf × 0.7. C. male inflorescence × 4. D. male flower × 5. E. stamen ×10. F female flower ×5. G. apical view of fruit × 2 . H. lateral view of fruit × 2. A-B from *Hyland* 12604 (BRI); C–E from *Hyland* 12601 (BRI); F from *Jessup* 2818 (BRI); G-H from *Hyland* 7901 (BRI). Del. W. Smith.

1073, c. 10 miles [16.7 km] N of Cairns, Jan 1961, *Dansie* 1994 (BRI); T.R. 315, N of Kuranda, Aug 1954, *White* 780 (BRI); ditto, Aug 1954, *Smith* 5314 (BRI); Kuranda area, Jan 1961, *Dansie* 1788 (BRI); ditto, Apr 1955, *Volck* 1109 (BRI); S.F.R. 607 West L.A., 17°00'S, 145°40'E, Dec 1974, *Hyland* 7902 (BRI, CANB, QRS); S.F.R. 607, Bridle L.A., 17°00'S, 145°40'E, Dec 1974, *Hyland* 7897 (BRI, CANB, QRS).

Distribution and habitat**:** *Drypetes iodoformis* is endemic in the 'Wet Tropics' region of north-east Queensland with a small number of populations from near Mt Finnegan in the north to near Kuranda in the south (**Map 3**). Plants grow as canopy trees in mesophyll or notophyll vine forest on metamorphic or granite substrates.

Notes**:** Hyland (1971) first mentioned *D. iodoformis* as *D.* sp. AFO/780. The late L.S.Smith annotated a number of specimens at BRI as '*D. iodiformis* L.S.Sm. sp. nov.' and left a manuscript description but his work was never published. Airy Shaw (1976, 1980a, 1980b) considered that this Australian taxon was a highly disjunct occurrence of *D. subcubica* (J.J.Sm.) Pax & K.Hoffm.

D. subcubica occurs in Java and the Lesser Sunda Islands in Malesia. Airy Shaw (1980a) considered the specimen *van Royen* 3551 from Batanta Island, Irian Jaya (New Guinea) to be *D. subcubica* and his record of the species for the New Guinea flora appears to be based on this. The BRI duplicate of this collection differs from typical *D. subcubica* in the greater number of stamens (12 as opposed to 6) and appears to be a more robust plant with broader elliptic leaves. The record of *D. subcubica* from New Guinea is therefore discounted.

The Australian plant is superficially similar, but differs in a number of significant ways from typical *D. subcubica* (**Table 2**) and is described here as a new species. I have taken up Smith's unpublished name, as the iodoform scent (iodine) in the cut bark is distinctive, having been noted by many collectors, and is useful as a diagnostic character (Hyland & Whiffin 1993).

Airy Shaw never lectotypified *D. subcubica*, and although there are duplicates of some of the syntypes at K, the majority are at BO and were not seen by him as he never visited that institution (A. Kostermans, pers. comm. 1992). *D. subcubica* is lectotypified at the end of this paper.

Table 2. Comparison of *Drypetes subcubica* and *D. iodoformis*.

Character	*D. subcubica*	*D.iodoformis*
Female flowers	2–4 per axil	1 per axil
Female floral disk	densely hairy	glabrous
Stigmas	entire, flabellate	bifid, linear-flabellate
Ovary	cubic-globose	ovoid
Fruit	cubic-globose, with 4 marked longitudinal grooves	ellipsoid-ovoid without marked longitudinal grooves

Conservation status**:** *Drypetes iodoformis* is a rarely collected plant, but one that is probably not endangered or threatened. It is present in National Parks at Cape Tribulation (Noah Creek), Mt Hemmant and Mt Finnegan.

Etymology**:** The specific epithet refers to the 'iodiform' (iodine) scent to the wood when it is cut.

Specimens of uncertain status: There may be an additional unnamed taxon of *Drypetes* that is endemic to Cape York Peninsula. As yet no fertile material has been collected to ascertain this.

Drypetes sp.

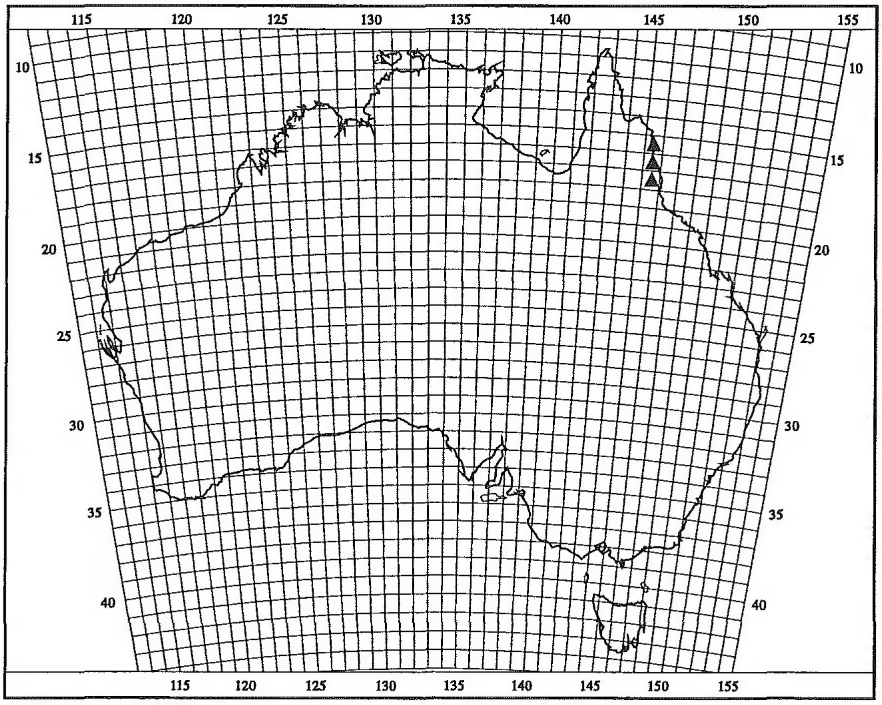
Specimens examined: **Queensland.** COOK DISTRICT: Lockerbie Scrub, 10°45'S, 142°32'E, Jun 1994, *Forster* 15297 & *Tucker* (BRI); Iron Range airstrip, 12°40'S, 143°20'E, Nov 1974, *Robinson* [AQ202297] (BRI); Ham Hill, Iron Range, 12°43'S, 143°18'E, Jul 1993, *Forster* 13589 *et al.* (BRI); Iron Range N.P.#8, 1.3 km NE of Mt Tozer, 12°44'S, 143°13'E, May 1994, *Fell* DGF4081 et al. (BRI); Chester River, Silver Plains, 13°41'S, 143°28'E, Jul 1993, *Forster* 13640 et al. (BRI); 31 km along road to Leo Creek Mine, McIlwraith Range, 13°42'S, 143°19'E, Jun 1995, *Forster* 16819 (BRI); McIlwraith Range, NE of Coen, 1962, *Webb & Tracey* 7362 (BRI); Rocky River on eastern foothills of McIlwraith Range, 13°47'S, 143° 25'E, Oct 1969, *Webb & Tracey* 9392 (BRI); Goanna Creek, E of McIlwraith Range, Nov 1956, *Webb* 3151 (BRI).

***Distribution and habitat*:** Known from Cape York and the McIlwraith and Iron Ranges where it grows in evergreen notophyll vine forest.

***Notes*:** These sterile collections may represent a further undescribed species of *Drypetes*. They are most similar to *D. acuminata* but are markedly geographically disjunct from that species and occur in vine forests with a different structure and floristic composition. Material of this taxon was first collected by Webb and Tracey who also had doubts as to its conspecificity with typical *D. deplanchei*. Airy Shaw determined some BRI sheets of these collections as *D. australasica*, but undoubtedly failed to appreciate the ecological differences between the habitat of each taxon.

Lectotypification of *Cyclostemon subcubicus*

Drypetes subcubica (J.J.Sm.) Pax & K.Hoffm. in Engl., Pflanzenr. 15 : 250 (1922); *Cyclostemon subcubicus* J.J.Sm. in Koord. & Valet., Meded. Dep. Landb. 10: 216 (1910). **Type:** Java. 12 Sep 1896, *Koorders* 25289 (lecto [here designated]: K n.v., photo at BRI; isolecto: BO).



Map 3. Distribution of *Drypetes* in Australia. ▲ *D. iodoformis.*

***Additional specimens examined*:** **Java:** 29 Aug 1889, *Koorders* 2145 (lectopara: BO); 15 Mar 1892, *Koorders* 2140 (lectopara: BO); May 1892, *Koorders* 2148 (lectopara: BO); 27 Oct 1896, *Koorders* 26179 (lectopara: BO); 18 Mar 1900, *Koorders* 37987 (lectopara: BO).

***Notes*:** Smith (1910) cited six syntypes in the protologue of *Cyclostemon subcubicus*. The best of these is undoubtedly a fruiting specimen (*Koorders* 25289) demonstrating the distinctive cubic nature of the fruit. This collection is present at both K and BO, and the specimen at the former is here selected as lectotype of the name.

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References

AIRY SHAW, H.K. (1976). New or noteworthy Australian Euphorbiaceae. *Kew Bulletin* 31: 341–398.

—— (1980a). The Euphorbiaceae of New Guinea. Kew Bulletin Additional Series VIII. London: Royal Botanic Gardens, Kew.

—— (1980b). A partial synopsis of the Euphorbiaceae - Platylobeae of Australia (excluding *Phyllanthus*, *Euphorbia* and *Calycopeplus*). *Kew Bulletin* 35: 577–700.

BAILEY, F.M. (1902). Euphorbiaceae. In Queensland Flora 5: 1392–1457. London: L. Reeve & Co.

BARLOW, B.A. & HYLAND, B.P.M. (1988). The origins of the flora of Australia's wet tropics. *Proceedings of the Ecological Society of Australia* 15: 1–17.

BENTHAM, G. (1873). Euphorbiaceae. In Flora Australiensis 6: 41–153. London: L. Reeve & Co.

BROCK, J. (1988). Top End Native Plants. Darwin: J. Brock.

CHRISTOPHEL, D.C. & HYLAND, B.P.M. (1993). Leaf Atlas of Australian Tropical Rain Forest Trees. Melbourne: CSIRO Publications.

FLOYD, A.G. (1989). Rainforest Trees of Mainland South-eastern Australia. Melbourne & Sydney: Inkata Press.

FORSTER, P.I., BOSTOCK, P.D., BIRD, L.H. & BEAN, A.R. (1991). Vineforest Plant Atlas for South-east Queensland. Queensland Herbarium: Brisbane.

FRANCIS, W.D. (1981). Australian Rain-forest Trees. (4th. Ed.) Canberra: Australian Government Publishing Service.

GREEN, P.S. (1986). Notes relating to the floras of Norfolk and Lord Howe Islands, II. *Journal of the Arnold Arboretum* 67: 109– 122.

—— (1990). Notes relating to the floras of Norfolk and Lord Howe Islands, III. *Kew Bulletin* 45: 235–255.

—— (1994). Euphorbiaceae. *Flora of Australia* 49: 227–238.

HAUSER, J. (1992). Fragments of Green. Bardon (Brisbane): Rainforest Conservation Society Inc.

HEWSON, H. (1988). Plant Indumentum. A Handbook of Terminology. Australian Flora & Fauna Series No. 9. Canberra: Australian Government Publishing Service.

HYLAND, B.P.M. (1971). A key to the common Rainforest Trees between Townsville and Cooktown, based on leaf and bark features. Brisbane: Dept. of Forestry.

HYLAND, B.P.M. & WHIFFIN, T. (1993). Australian Tropical Rain Forest Trees - An Interactive Identification System. Melbourne: CSIRO Publications.

INNIS, G.J. (1989). Feeding ecology of fruit pigeons in subtropical rainforests of south-eastern Queensland. *Australian Wildlife Research* 16: 365–394.

McPherson, G. (1991). *Drypetes* Vahl. In Euphorbiaceae - Phyllanthoideae. Flore de la Nouvelle-Calédonie et Depéndances 17: 12–14. Paris: Muséum National d'Histoire Naturelle.

Mueller, J. (1866). Euphorbiaceae. In A.L.L.P. de Candolle (ed.), Prodromus Systematis Naturalis Regni Vegetabilis 15(2): 189–1260. Paris: Masson.

Radcliffe-Smith, A. (1987). Flora of Tropical East Africa. Euphorbiaceae (Part 1). Rotterdam/Boston: A.A. Balkema.

Russell-Smith, J. & Lee, A.H. (1992). Plant populations and monsoon rain forest in the Northern Territory, Australia. *Biotropica* 24: 471–487.

Smith, J.J. (1910). In Bijdrage No. 12 tot de Kennis der Boomsoorten op Java door Dr. S.H. Koorders en Dr. Th. Valeton, J.J. Smith elab. Mededeelingen Uitgaande van het Departement van Landbouw No. 10.

Vahl, M. (1807). Eclogae Americanae. Copenhagen: N. Müller.

Webb, L.J. (1978). A general classification of Australian rainforests. *Australian Plants* 9: 349–363.

Webb, L.J. & Tracey, J.G. (1981). Australian rainforests: pattern and change. In A. Keast (ed.), Ecological Biogeography of Australia. pp. 605–694. The Hague: W. Junk.

Webster, G.L. (1994). Synopsis of the genera and suprageneric taxa of Euphorbiaceae. *Annals of the Missouri Botanical Garden* 81: 33–144.

Williams, K.A.W. (1987). Native Plants of Queensland. Vol. 3. Ipswich: K.A.W. Williams.